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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,027	07/30/2003	Joel M. Dry	OPTOLUM-005	9520
7590 03/21/2006			EXAMINER	
DONALD J. LENKSZUS			HO, TU TU V	
PO BOX 3064			ART UNIT	
CAREFREE, AZ 85377-3064			PAPER NUMBER	
			2818	

DATE MAILED: 03/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

✓ H.A.

Office Action Summary	Application No.	Applicant(s)	
	10/631,027	DRY, JOEL M.	
	Examiner	Art Unit	
	Tu-Tu Ho	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2006.
- 2a) ☐ This action is **FINAL**.
- 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-63 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-63 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/26/2006 has been entered.

Request for Telephonic Interview

2. The examiner is available for a telephonic interview in accordance with MPEP 713.01. As for the matter of rejection of claims, the matter is reviewable by the Board of Patent Appeals and Interferences as provided for in MPEP 2163.06, and for the matter of restriction requirement, the matter is petitionable to the Examiner's Supervisory.

Response to Arguments

3. Applicant's arguments with respect to claims 1-63 have been considered but are moot in view of the new ground(s) of rejection.

While the examiner is not necessarily persuaded by Applicant's arguments, the rejection of the previous office action has been withdrawn in favor of new grounds of rejections based on Applicant's submission filed on 01/26/2006 and on newly discovered references.

Specification

4. The disclosure is objected to because of the following informalities: The last sentence of paragraph [0029] is not terminated. Said sentence should be terminated.

Appropriate correction is required.

Drawings

5. The drawings are objected to under 37 CFR 1.83(a) because they fail to show "Connector 113" as described in the specification, paragraph [0030]. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

6. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “extrusion” of **claims 9, 10, 30, 31, 51, and 52**, the “protrusions” of **claims 4, 25, and 46**; the “polygon” of **claims 6, 12, 27, 33, 48, and 54**; and the “triangular” of **claims 13, 34, and 55** must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. **Claims 1-5, 9-11, 14, 17, 20, 22-26, 30-32, 35, 38, 41, 43-47, 51-53, 56, 59, and 62** are rejected under 35 U.S.C. 102(b) as being anticipated by Arndt et al. U.S. Patent 6,848,819 (the '819 reference).

The '819 reference discloses in the figures and respective portions of the specification a light source and a radiation emitting source as claimed.

Referring to **claim 1**, the reference discloses a light source comprising:

an elongate thermally conductive member (generally indicated at 3/1, Fig. 2B, col. 3, line 55, through col. 4, line 61, particularly col. 4, lines 1-23 and lines 41-61) having an outer surface;

at least one solid-state light source (2, "LED", col. 3, lines 55-60, col. 1, lines 5-10) carried on said elongate member outer surface (Fig. 2B);

one or more electrical conductors (electrical conductors, not shown, col. 3, lines 1-17) carried by said elongate member and connected to said at least one solid-state light source to supply electrical power thereto; and

said elongate thermally conductive member being configured to conduct heat away from said at least one solid-state light source to fluid contained by said elongate thermally conductive member (col. 4, lines 41-61).

Referring to **claim 2** and using the same reference characters, interpretations, and citations as detailed above for claim 1 where applicable, the reference discloses a light source comprising:

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an elongate thermally conductive member having an outer surface;

a plurality of solid state light sources carried on said elongate member outer surface at least some of said solid state light sources being disposed in a first plane and others of said solid state light sources being disposed in a second plane not coextensive with said first plane;

electrical conductors carried by said elongate thermally conductive member and connected to said plurality of solid state light sources to supply electrical power thereto; and

said elongate thermally conductive member being configured to conduct heat away from said solid state light sources to fluid contained by said elongate thermally conductive member.

Referring to **claim 22** and using the same references, citations, and interpretations as detailed above for claim 1 where applicable, the reference discloses a radiation emitting source comprising:

an elongate thermally conductive member having an outer surface;

at least one radiation emitting semiconductor device (light emitting diode (LED) 2, as light is a form of radiation, and as LED devices comprised semiconductor materials at the time the reference was disclosed) carried on said elongate member outer surface;

one or more electrical conductors carried by said elongate thermally conductive member and connected to said at least one radiation emitting semiconductor device to supply electrical power thereto; and

said elongate thermally conductive member being configured to conduct heat away from said at least one radiation emitting semiconductor device to fluid contained by said elongate thermally conductive member.

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Referring to **claim 23** and using the same references, citations, and interpretations as detailed above for claims 1 and 22 where applicable, the reference discloses a radiation emitting source comprising:

- an elongate thermally conductive member having an outer surface;

- a plurality of radiation emitting semiconductor devices carried on said elongate member outer surface at least some of said radiation emitting semiconductor devices being disposed in a first plane and others of said radiation emitting semiconductor devices being disposed in a second plane not coextensive with said first plane;

- electrical conductors carried by said elongate thermally conductive member and connected to said plurality of radiation emitting semiconductor devices to supply electrical power thereto; and

- said elongate thermally conductive member being configured to conduct heat away from said radiation emitting semiconductor devices to fluid contained by said elongate thermally conductive member.

Referring to **claim 43** and using the same references, citations, and interpretations as detailed above for claim 1 where applicable, the reference discloses a radiation emitting source comprising:

- an elongate thermally conductive member having an outer surface;

- at least one radiation emitting solid state device (light emitting diode (LED) 2, as light is a form of radiation and as LED devices were solid state devices at the time the reference was disclosed) carried on said elongate member outer surface;

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one or more electrical conductors carried by said elongate thermally conductive member and connected to said at least one radiation emitting solid state device to supply electrical power thereto; and

said elongate thermally conductive member being configured to conduct heat away from said at least one radiation emitting solid state device to fluid contained by said elongate thermally conductive member.

Referring to **claim 44** and using the same references, citations, and interpretations as detailed above for claims 1 and 43 where applicable, the reference discloses a radiation emitting source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of radiation emitting solid state devices carried on said elongate member outer surface at least some of said radiation emitting solid state devices being disposed in a first plane and others of said radiation emitting solid state devices being disposed in a second plane not coextensive with said first plane;

electrical conductors carried by said elongate thermally conductive member and connected to said plurality of radiation emitting solid state devices to supply electrical power thereto; and

said elongate thermally conductive member being configured to conduct heat away from said radiation emitting solid state devices to fluid contained by said elongate thermally conductive member.

Referring to **claims 3, 17, 24, 38, 45, and 59**, the reference further discloses that said fluid comprises air (col. 4, lines 55-61), which is a thermal transfer media, as is known in the art.

Referring to **claims 4, 25, and 46; and 9, 10, 30, 31, 51, and 52**, the reference further discloses that said elongate thermally conductive member (3) comprises one or more heat dissipation protrusions or extrusions (“cooling ribs and/or a rough surface”, col. 2, lines 55-62), and further discloses that said extrusion (extruded portions - ribs) is an aluminum extrusion (because said extrusion is formed from said elongated thermally conductive member 3, which is formed of aluminum – col. 4, lines 5-9).

Referring to **claims 5, 26, and 47**, the reference further discloses that said elongate thermally conductive member comprises a tube (col.4, lines 45-50).

Referring to **claims 11, 32, and 53**, the reference further discloses that said elongate thermally conductive member is a tubular member (col.4, lines 45-50).

Referring to **claims 14, 35, and 56**, the reference further discloses that said elongate thermally conductive member comprises a flexible circuit (flexible printed circuit board 1, col. 4, lines 1-5) carried on a surface of said elongate thermally conductive member, said flexible-circuit printed circuit board comprising said electrical conductors.

Referring to **claims 20, 41, and 62**, the reference further discloses an electrically insulating layer (flexible printed circuit board 1, col. 4, lines 1-5) disposed on said elongate thermally conductive member outer surface and carrying said electrical conductors thereon.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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8. **Claims 6-8,12,13,18,19,27-29,33,34,39,40,48-50,54,55,60 and 61** are rejected under 35 U.S.C. §103(a) as being unpatentable over Arndt et al. U.S. Patent 6,848,819 (the '819 reference).

Referring to **claims 6, 12-13, 27, 33-34, 48, and 54-55**, the '819 reference discloses a light source and a radiation emitting source substantially as claimed and as detailed above. The reference further discloses, also as detailed above, that said elongate thermally conductive member comprises a tube. The reference further discloses that said elongate thermally conductive member has a cross-section in the shape of a circle (Fig. 2B). Although the reference does not disclose that the shape could be a polygon or a triangular, the shape differences are considered obvious and are not patentable unless unobvious or unexpected results are obtained from these changes.

Referring to **claims 7, 28, and 49**, said tubular thermally conductive member (comprising cooling member 3, thermally conductive adhesive 6, good-thermal conductive layer 4, and cooling ribs, as detailed above) should have a cross-section having flat portions.

Referring to **claims 8, 18, 29, 39, 50, and 60**, the '819 reference discloses a light source and a radiation emitting source substantially as claimed and as detailed above including said elongate thermally conductive member comprising said thermal transfer media and said cooling ribs. The reference further discloses that said thermal transfer media can flow through said elongate thermally conductive member (col. 4, lines 55-61). Although the reference does not disclose that said elongate thermally conductive member comprises a flow channel for said thermal transfer media, it would appear that said cooling ribs should form a channel so as to facilitate said flowing of said thermal transfer media.

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Referring to **claims 19, 40, and 61**, the reference discloses a device as claimed and as detailed above including said elongated thermally conductive member, and further discloses that said elongated thermally conductive member is housed in a fixture (not shown). The reference, however, does not disclose using a clip (securing device, for mounting said elongate thermally conductive member in the fixture) as claimed. Nevertheless, the various securing devices were just different configurations one of ordinary skill in the art would find obvious for mounting or securing said elongate thermally conductive member into said fixture, and therefore such selecting of securing devices would have been obvious to one of ordinary skill in the art at the time the invention was made.

9. Claims 15-16, 21, 36-37, 42, 57-58, and 63 are rejected under 35 U.S.C. §103(a) as being unpatentable over Arndt et al. U.S. Patent 6,848,819 (the '819 reference) in view of Hochstein et al. U.S. Patent 6,517,218.

The '819 reference discloses a light source and a radiation emitting source substantially as claimed and as detailed above including said flexible circuit (1) or said electrically insulating layer (1) for receiving said plurality of solid state light sources. However, the reference does not disclose that said flexible circuit or said electrically insulating layer comprises a plurality of apertures for said receiving said plurality of solid state light sources, thus further does not disclose that each of said solid state light sources is disposed in a corresponding one of said apertures and affixed in thermally conductive contact with said elongate thermally conductive member.

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Hochstein, in also disclosing a light source and a radiation emitting source, and in particular in the same effort to reduce heat for solid state light sources, teaches that by positioning a solid state light source - which is generally indicated by a device comprising LED 12, terminals 14 and 16, a portion 25, and an encapsulant 24/26 (Fig. 2) - so that said solid state light source is in an aperture of insulating layer 32 allows said solid state light source to be in intimate thermal contact with thermally conductive member 30, further improving thermal performance (col. 2, lines 1-67, particularly lines 5-10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the '819 reference's device such that each of its solid state light sources is in a corresponding one of apertures formed in the flexible circuit (1) and affixed in thermally conductive contact with said elongate thermally conductive member (3). One would have been motivated to make such a change in view of the teachings in Hochstein that such a change results in a solid state light source with improved thermal improvement.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu-Tu Ho whose telephone number is (571) 272-1778. The examiner can normally be reached on 6:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID NELMS can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tu-Tu Ho
March 13, 2006